Panelists

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Agenda

● Quick overview of RDM
● RDM Parameter Messages
● The standards that make up RDM
● Overview of useful PIDs
● RDM time savers
● E1.33 / RDMnet
Overview of RDM

- An enhancement to USITT DMX512 for configuration, status monitoring, and management of DMX512 based systems.

- An open standard developed by the PLASA Technical Standards Program that allows interoperability between many manufacturers.

- Compliant DMX512 and DMX512-A devices are completely functional when RDM is present.

- Proper cable types and end-of-line termination is a must when using RDM.
RDM Parameters

● Once an RDM controller has discovered a responder, it can send GET or SET commands to the responder.

● The format of these commands are defined in the parameter message.

● Some types of commands may require additional data, for example SET DMX_START_ADDRESS.

● Each type of parameter message is assigned a 2 byte Parameter Identifier (PID).
RDM Parameters

- PIDs allow us to extend RDM, without having to change the original standard.

- PIDs also allow manufacturers to extend RDM outside the PLASA standards process but such extension messages are limited to their own equipment.

- A responder isn't required to support all PIDs, manufacturers make the decision which PIDs to implement.

- If a responder is missing a PID and you think it would be useful, ask the manufacturer!
# RDM - More than just E1.20

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1.20, RDM-Remote Device Management over USITT DMX512 Networks</td>
<td>Published in 2006, revised in 2010</td>
<td></td>
</tr>
<tr>
<td>E1.37-1, Additional Message Sets for ANSI E1.20 (RDM) – Part 1, Dimmer Message Sets</td>
<td>Published in 2012</td>
<td></td>
</tr>
<tr>
<td>E1.37-3, Additional Message Sets for ANSI E1.20, LED walls and video displays</td>
<td>Planning stages</td>
<td></td>
</tr>
<tr>
<td>E1.33, Transport of ANSI E1.20 (RDM) in an E1.31 environment</td>
<td>Completed 2nd Public Review in October 2012</td>
<td></td>
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</tbody>
</table>
Selected PIDs from E1.20

Features you may not know you had:

- Lamp On / Off
- Device Reset
- Adjust Personalities
- Read sensor information
  - The RDM protocol supports many different types of sensors, including temperature, humidity, voltage, current, acceleration, pressure and more.
Selected PIDs from E1.37-1

E1.37-1 contains many PIDs which are relevant to dimmers.

- Dimmer curves
- Min & Max dimmer levels
- Startup mode
- Fail mode
- Output Response time
- Lock codes
Selected PIDs from E1.37-2

E1.37-2 focuses on configuring IPv4 and DNS settings

- List network interfaces
- IPv4 address & network mask
- DHCP mode
- Default Route
- DNS hostname
- DNS nameserver

We expect these to be used widely with E1.33 devices.
Proposed features for E1.37-3

E1.37-3 focuses on expanding RDM / RDMnet support to video devices monitoring and configuration.

- LED Walls
- Creative LED systems
- Projection
- Image Processing
- Video Switchers/Routers
Researching Products

- [http://rdm.openlighting.org](http://rdm.openlighting.org) contains an index of RDM products
- For each product it tracks:
  - Software versions
  - Supported PID(s)
  - Sensor types
  - Personalities

- If you're a manufacturer it's easy to get your products listed, see me after the session.
Save and Restore Settings

- RDM makes it easy to take a snapshot of the settings for a rig and then restore them at a later date.
- You could also take a before and after snapshot, and compare the differences.
What Is E1.33?

● Brings the benefits of bi-directional communication to IP networks.
● E1.33 is to E1.31 (sACN) as RDM is to DMX512
● Can be thought as as RDM for Ethernet
● Three parts:
  ○ Discovery
  ○ Node Configuration
  ○ RDM Message passing

Nodes connected to an E1.33 network are either:
● Controllers, typically consoles or monitoring devices
● Devices (can act as a DMX512/RDM gateway, native E1.31 device or both)
E1.33 Discovery

- E1.33 discovery builds on a technology called SLP (Service Location Protocol)
  - Established protocol most commonly used for discovering printers on a network.

SLP Terms:
- Service Agents (SA) are hosts that provide a service, e.g. a printer. In E1.33 SAs are the gateways or native devices.
- User Agents (UA) are hosts that use a service. In E1.33 UAs are the consoles or monitoring equipment.
- Directory Agents (DAs) are specific network hosts that act as a rendezvous point in larger networks.
E1.33 Discovery

● E1.33 networks can operate in one of two modes
  ○ No Directory Agents (DAs)
  ○ One or more Directory Agents

● DAs allow E1.33 to scale to very large networks

● We generally expect consoles to implement the DA feature, this isn't required though.

● No configuration is required to switch modes, when a DA exists the hosts will use it, otherwise they'll fall back to non-DA mode.
E1.33 Discovery

- Once a controller has discovered the IP address of all devices, it can then ask each device to enumerate the endpoints it contains using the ENDPOINT_LIST PID.

- Controllers can then fetch a list of all UIDs connected to each endpoint.

- This completes the discovery phase, the controller now has a complete list of UIDs, and which endpoints & devices they are attached to.

- Controllers can then start communicating with the RDM devices.
E1.33 Requests & Responses.

- RDM messages are wrapped in a similar packet structure as E1.31
E1.33 Device Configuration

- Allows assigning gateway endpoints (DMX512 ports) to sACN universes.
- An endpoint can be in either Composite or Standard universe mode.
  - Standard universes provide for complete mapping of an entire universe directly to an endpoint without any other manipulation.
  - A Composite universe is a universe that is constructed by merging, re-patching, or manipulating the Null Startcode data from one or more E1.31 universes to create a new universe of DMX512 data.
    - The mapping is outside of E1.33.
    - Removes the ability to do DMX address auto-patching.
E1.33 Device Configuration

Some of the new PID messages for E1.33:

- **ENDPOINT_LIST** - Provides packed list of Endpoint IDs on a Gateway/Device.
- **ENDPOINT_IDENTIFY** - Provides visual identification of the Gateway Port.
- **ENDPOINT_TO_UNIVERSE** - Assigns a given endpoint to a Universe. (Native devices also).
- **RDM_TRAFFIC_ENABLE** - Enables/Disables RDM traffic on an output endpoint for non-compliant legacy devices.
- **INITIATE_DISCOVERY**
- **BACKGROUND_DISCOVERY** - Enables/Disables auto discovery.
- **ENDPOINT_TIMING** - Configure endpoint refresh/timing profile.
Over to you...

What features would you like to see in RDM?
More Information?

● PLASA Control Protocols Booth
  ○ Booth #2041 (across from the PLASA booth)

● [http://www.rdmprotocol.org](http://www.rdmprotocol.org)

● [http://rdm.openlighting.org](http://rdm.openlighting.org)